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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant:	Chengua O. Han	§	Art Unit:	3641
Serial No.:	10/027,727	§	Examiner:	Stephen Johnson
Filed:	December 21, 2001	§		
Title:	SHAPED CHARGE	§	Docket No.	22.1450 (SHL.0227US)

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APPEAL BRIEF TRANSMITTAL

Dear Sir:

In response to the Notice of Non-Compliant Appeal Brief dated September 12, 2006, enclosed is an Amended Appeal Brief which includes the headings for the Evidence Appendix and Related Proceedings Appendix.

Respectfully submitted,

Date: October 12, 2006

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Date of Deposit: October 12, 2006
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AMENDED APPEAL BRIEF

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Janice Munoz

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REAL PARTY IN INTEREST

The real party in interest is Schlumberger Technology Information, the assignee of the present application by virtue of the assignment recorded at reel/frame 012408/0157.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

Claims 1, 3, 6, 7, 17-19, 22, 23, 25, 27, 28, 30 and 33-35 have been finally rejected and are the subject of this appeal.

STATUS OF AMENDMENTS

There are no unentered amendments.

SUMMARY OF CLAIMED SUBJECT MATTER

At this point, no issue has been raised that would suggest that the words in the claims have any meaning other than their ordinary meanings. Nothing in this section should be taken as an indication that any claim term has a meaning other than its ordinary meaning.

The control debris perforating system of independent claim 1 includes a shaped charge that has a charge case and an explosive material. The charge case defines at least one slot about which the charge case is adapted to fracture in response to detonation of the explosive material.

Fig. 1 depicts a shaped charge 1 of the prior art. The shaped charge 1 includes a charge case, an explosive 12 and a liner 14. The shaped charge case 1 is described beginning on line 16 of page 2 and extending through line 11 of page 3 of the specification. Specification, pp. 2-3.

In contrast to Fig. 1, Figs. 4 and 5 depict a possible embodiment of claim 1. These figures depict a shaped charge 40 that includes a charge case 44. The charge case 44 includes slots, or grooves 42, that are cut into the charge case 44 to weaken the case 44. Due to the weakened case at the grooves 42, the charge case 44 fractures along the grooves 42 upon firing of the shaped charge 40. Therefore, due to the grooves 42, the size and shape of debris that is generated by the charge case 44 may be more precisely controlled, as compared to conventional charge cases. Specification, pp. 3-4.

Claim 3 depends from claim 1 and recites that the slot(s) that are defined by the charge case is axially oriented.

An example of a possible embodiment for the system of claim 3 is shown in Figs. 4, 5, 6 and 7. As shown, the slots 42 in the depicted charge case are axially oriented. Specification, pp. 3-4.

The method of independent claim 17 recites providing a perforating string that has one or more shaped charges. The shaped charges include a charge case that defines at least slot about which the charge case is adapted to fracture. The method includes conveying the perforating string into the well.

The specification describes a perforating string that has the features described in the act of providing of claim 17. This embodiment is described in connection with the shaped charge 40 and its charge case 44. This perforating gun string may be conveyed into a well for firing. Specification, pp. 2-3.

Independent claim 33 recites a method of controlling debris during perforating. This method includes providing a shaped charge having a charge case that defines at least one groove about which the charge case is adapted to fracture in response to detonation of an explosive.

The shaped charge 40 (a possible embodiment of claim 33) depicted in Figs. 4 and 5 has these features, as discussed above. Specification, pp. 3-4.

Claim 34 depends from claim 33 and recites that the slot(s) that are defined by the charge case is axially oriented. The specification describes a possible embodiment of claim 34 in the discussion of the shaped charge 40 and the depiction of the shaped charge in Figs. 4, 5 and 6. Specification, pp. 3-4.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. **Can claims 1, 7, 17, 22, 23, 25, 27, 28, 30, 33 and 35 be anticipated under 35 U.S.C. § 102(e) by Renfro when Renfro fails to disclose all of the limitations of either independent claim 1, 17 or 33?**

1. **Can claims 1, 7, 22, 23 and 25 be anticipated when Renfro fails to teach all of the limitations of independent claim 1?**

2. **Can claims 17, 27, 28 and 30 be anticipated by Renfro when Renfro fails to teach all of the limitations of independent claim 17?**

3. **Can claims 33 and 35 be anticipated by Renfro when Renfro fails to disclose all of the limitations of independent claim 33?**

B. **Can claims 3 and 34 be rendered obvious under 35 U.S.C. § 103(a) as being unpatentable over Renfro in view of the German reference when the Examiner has failed to establish a *prima facie* case of obviousness?**

C. **Can claims 17 and 18 be anticipated under 35 U.S.C. § 102(b) by Chawla when Chawla fails to disclose all limitations of independent claim 17?**

D. **Can claims 1, 3, 6, 22, 23, 25, 27, 28, 30, 33 and 34 be anticipated under 35 U.S.C. § 102(b) by the German reference when the German reference fails to disclose all limitations of either independent claim 1 or claim 33?**

1. **Can claims 1, 3, 6, 22, 23 and 25 be anticipated when the German reference fails to disclose all limitations of independent claim 1?**

2. **Can claims 33 and 34 be anticipated when the German reference fails to disclose all limitations of independent claim 33?**

ARGUMENT

A. Can claims 1, 7, 17, 22, 23, 25, 27, 28, 30, 33 and 35 be anticipated under 35 U.S.C. § 102(e) by Renfro when Renfro fails to disclose all of the limitations of either independent claim 1, 17 or 33?

The Examiner rejects claims 1, 7, 17, 22, 23, 25, 27, 28, 30, 33 and 35 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,619,176 (herein called "Renfro"). Renfro generally describes a liner for a shaped charge. Independent claims 1, 17 and 33 overcome the § 102(e) rejections and thus, the claims that depend therefrom overcome the §§ 102 and 103 rejections, for at least the reasons that are set forth below.

1. Can claims 1, 7, 22, 23 and 25 be anticipated when Renfro fails to teach all of the limitations of independent claim 1?

The control debris perforating system of claim 1 includes a shaped charge that has a charge case and an explosive material. The charge case defines at least one slot about which the charge case is adapted to fracture in response to detonation of the explosive material.

In the § 102 rejection of independent claim 1, the Examiner labels the housing 12 of Renfro as the alleged shaped charge case, labels Renfro's shaped explosive 28 as the alleged explosive material and labels one of the troughs appearing at reference numeral 16 (Fig. 1) of Renfro as being the alleged slot of claim 1. Final Office, 2-3.

As stated above, Renfro's disclosure is directed to a liner for a shaped charge. Although Renfro's housing 12 is depicted in fig. 1 as containing "troughs" (pointed to by reference numeral 16), there is no teaching or suggestion in Renfro that the housing 12 (the alleged charge case) is adapted to fracture about any of the troughs when the explosive material 28 detonates. More specifically, Renfro does not discuss any specific feature of the housing 12 (the alleged shaped charge case) other than its outer wall 14, inner wall 16, base 18 and mouth 20. Renfro, 7:27-28. Renfro does not discuss any specific features of the inner wall 16 and does not discuss any "slots" about which the housing 12 is adapted to fracture when the disclosed shaped charge fires. Thus, Renfro fails to anticipate independent claim 1.

The Examiner refers to the language found in lines 63-67 in column 3 of Renfro, lines 1-14 in column 4 of Renfro, lines 45-63 in column 5 of Renfro and lines 50-57 in column 10 of Renfro. Final Office Action, 3. All of this language addresses a subject matter that is separate

from the depicted troughs in the inner wall 16 of the housing 12. More specifically, the language cited by the Examiner refers to striations that are formed in the physical exterior of a skirt portion of a liner 50 of the shaped charge. However, there is no teaching or suggestion in Renfro that such striations are formed in the housing 12. Furthermore, as depicted in Fig. 1, the liner 50 is separated from the housing 12 (the alleged charge case) by the explosive material 28. There is no teaching or even a suggestion in Renfro of a slot in the housing 12 about which the housing 12 is adapted to fracture.

Although the Examiner selectively reads Renfro to somehow link the troughs in the inner wall 16 of the housing 12 to the striations in the liner 50, when the different passages of Renfro are read in their proper contexts, it becomes clear that Renfro does not teach or even suggest at least one slot that is formed in a charge case about which the charge case is adapted to fracture in response to the detonation of an explosive material. Thus, Renfro fails to anticipate independent claim 1.

Claims 7, 22, 23 and 25 overcome the § 102 rejections in view of Renfro for at least the reason that these claims depend from independent claim 17. Therefore, for at least the reasons that are set forth above, the § 102(e) rejections of claims 1, 7, 22, 23 and 25 as being anticipated by Renfro are improper and should be reversed.

2. Can claims 17, 27, 28 and 30 be anticipated by Renfro when Renfro fails to teach all of the limitations of independent claim 17?

The method of independent claim 17 recites providing a perforating string that has one or more shaped charges. The shaped charges include a charge case that defines at least slot about which the charge case is adapted to fracture. The method includes conveying the perforating string into the well.

Renfro fails to teach the act of providing of independent claim 17. More specifically, there is no teaching or even a suggestion in Renfro of a charge case that defines at least one slot about which the charge case is adapted to fracture. More specifically, although the housing 12 in Fig. 1 of Renfro depicts (Fig. 1) troughs in the interior wall 16 of the housing 12, there is no teaching or even a suggestion in Renfro that the housing 12 is adapted to fracture about either of these troughs. Although Renfro discloses striations in the liner 50, there is no teaching or

suggestion of such striations in the housing 12. Therefore, for at least this reason, Renfro fails to anticipate independent claim 17.

Claims 27, 28 and 30 overcome the § 102 rejections in view of Renfro for at least the reason that these claims depend from independent claim 30.

Thus, for at least the reasons that are set forth above, the § 102(e) rejections of claims 17, 27, 28 and 30 as being anticipated by Renfro are in error and should be reversed.

3. Can claims 33 and 35 be anticipated by Renfro when Renfro fails to disclose all of the limitations of independent claim 33?

Claim 33 recites a method of controlling debris during perforating. This method includes providing a shaped charge having a charge case that defines at least one groove about which the charge case is adapted to fracture in response to detonation of an explosive.

Renfro fails to anticipate independent claim 33 for at least the reason that Renfro fails to disclose a charge case that defines at least one groove about which the charge case is adapted to fracture in response to detonation of an explosive. Although Renfro discusses its liner as containing striations in a liner of a shaped charge, Renfro fails to teach or even suggest at least one slot in a charge case to facilitate breakup of a charge case. More specifically, Renfro fails to disclose any such slot for the housing 12, the alleged charge case of claim 33. Therefore, for at least this reason, Renfro fails to anticipate independent claim 33.

Claim 35 overcomes the § 102 rejection in view of Renfro for at least the reason that this claim depends from independent claim 33.

Therefore, for at least the reasons that are set forth above, the § 102(e) rejections of claims 33 and 35 as being anticipated by Renfro are in error and should be reversed.

B. Can claims 3 and 34 be rendered obvious under 35 U.S.C. § 103(a) as being unpatentable over Renfro in view of the German reference when the Examiner has failed to establish a *prima facie* case of obviousness?

Claim 3 depends from claim 1 and recites that the slot(s) is axially oriented. Claim 34 depends from claim 33 and recites that the groove is axially oriented.

The Examiner rejects claims 3 and 34 under 35 U.S.C. § 103(a) by hypothetically combining Renfro and German Patent No. 1,234,584 (herein called the "German reference"). However, the Examiner fails to show where the prior art contains the alleged suggestion or motivation to modify Renfro's shaped charge in view of the German reference to derive the claimed invention.

A *prima facie* case of obviousness requires more than a piecewise combination of elements from multiple references. Instead, a *prima facie* case of obviousness requires the Examiner to show that one skilled in the art, *without knowledge of the claimed invention*, would have modified Renfro in view of the German reference to derive the claimed invention (*emphasis added*). However, the Examiner has not shown where the prior art contains the alleged suggestion or motivation.

The German reference shows what appears to be a projectile 9 that includes some sort of grooves 10. However, the Examiner fails to show where the prior art contains the alleged suggestion or motivation to take the grooves 10 disclosed in Fig. 1 of Renfro and somehow apply this to Renfro's charge case. Without such a showing, a *prima facie* case of obviousness has not been established for claim 3. M.P.E.P. § 2143.

"Obviousness cannot be predicated on what is unknown." *In re Spormann*, 363 F.2d 444, 448, 150 USPQ 449, 452 (CCPA 1966). Rather, a *prima facie* case of obviousness requires the Examiner to show where the prior art contains the alleged suggestion or motivation for the modification of a reference. For at least the reason that the Examiner has failed to make this showing, the § 103(a) rejections of claims 3 and 34 are in error and should be reversed.

C. Can claims 17 and 18 be anticipated under 35 U.S.C. § 102(b) by Chawla when Chawla fails to disclose all limitations of independent claim 17?

The Examiner rejects claims 17 and 18 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,619,008 (herein called "Chawla"). Chawla generally discloses a technique to manufacture liners, such as the liners 36 that are depicted in Fig. 4 of Chawla. As depicted in Fig. 4 of Chawla, at a particular step in this manufacturing process, the liners 36 are part of a solid sheet. Score marks 46 are formed in the sheet to facilitate breaking of the individual liners 36 from this solid sheet. Chawla, 3:64-67.

The Examiner points out that after manufacture of the liners 36, the final product may contain some of the remnants left over from the score marks 46. Final Office Action, 5. However, regardless of whether remnants of the score marks 46 exist in the final product or not, there is no teaching in Chawla of a charge case that defines at least one slot about which the charge case is adapted to fracture. A liner does not constitute a charge case of a shaped charge. Furthermore, there is no disclosure in Chawla that the liner 36 is adapted to fracture about the score mark 46, or at least a portion of the score mark 46 that may exist (for purposes of argument) after manufacture of the liner 36. Therefore, for at least any of these reasons, Chawla fails to anticipate independent claim 17.

Claim 18 overcomes the § 102 rejection in view of Chawla for at least the reason that this claim depends from an independent claim. Thus, for at least the reasons that are set forth above, the § 102(b) rejections of claims 17 and 18 as being anticipated by Chawla are improper and should be reversed.

D. Can claims 1, 3, 6, 22, 23, 25, 27, 28, 30, 33 and 34 be anticipated under 35 U.S.C. § 102(b) by the German reference when the German reference fails to disclose all limitations of either independent claim 1 or 33?

The Examiner rejects claims 1, 3, 6, 22, 23, 25, 27, 28, 30, 33 and 34 under 35 U.S.C. § 102(b) as being anticipated by the German reference. Independent claims 1 and 30 overcome the § 102(b) rejections and thus, the claims that depend therefrom overcome the § 102(b) rejections, for at least the reasons that are set forth above. It appears that in the § 102(b) rejections in view of the German reference, the Examiner inadvertently adds claims 27, 28 and 30 to the list of rejected claims. It is noted that these claims ultimately depend from claim 17, which the Examiner has not rejected under 35 U.S.C. § 102(b) in view of the German reference. Therefore,

it is assumed that because claim 17 has not been rejected under § 102 in view of the German reference, claims 27, 28 and 30 overcome the § 102 rejections for at least this reason.

1. Can claims 1, 3, 6, 22, 23 and 25 be anticipated when the German reference fails to disclose all limitations of independent claim 1?

The control debris perforating system of independent claim 1 includes a charge case that defines at least one slot about which the charge case is adapted to fracture in response to detonation of the explosive material.

The Examiner relies on Fig. 1 of the German reference in the § 102 rejection of claim 1. However, the Examiner fails to specifically label the element that is considered to be the alleged charge case of claim 1. It is noted that the German reference appears to disclose a projectile that is formed from a case 1, an explosive 2 and a liner 4. Furthermore, the German reference appears to disclose a projectile 9. It is noted that the projectile 9 is not a charge case. Therefore, although grooves 10 may be formed in the projectile 9, these slots are not formed in a charge case. Furthermore, the Examiner has not shown where the German reference allegedly discloses that the alleged charge case is adapted to fracture about the grooves 10 in response to detonation of the explosive material 2. Therefore, for at least any of these reasons, the German reference fails to anticipate independent claim 1.

Claims 3, 6, 22, 23 and 25 overcome the § 102 rejections in view of the German reference for at least the reason that these claims depend from independent claim 1. Thus, for at least the reasons that are set forth above, the § 102 rejections of claims 1, 3, 6, 22, 23 and 25 as being anticipated by the German reference are in error and should be reversed.

2. Can claims 33 and 34 be anticipated when the German reference fails to disclose all limitations of independent claim 33?

The method of independent claim 33 includes providing a shaped charge that has a charge case that defines at least one groove about which the charge case is adapted to fracture in response to detonation of an explosive.

In the § 102(b) rejection of claim 33, the Examiner generally refers to Fig. 1 as allegedly showing a charge case 1. It appears that the projectile 9 of Fig. 1 may possibly include grooves 10. However, the Examiner fails to show why the German reference teaches that a charge case

(which appears to be element 1) is adapted to fracture about any of these grooves 10. Furthermore, the grooves 10 appear to be located in a projectile and not in the charge case 1. Therefore, for at least any of these reasons, the German reference fails to anticipate independent claim 33.

Claim 34 overcomes the § 102 rejection for at least the reason that this claim depends from independent claim 33. Thus, for at least the reasons that are set forth above, the § 102(b) rejections of claims 33 and 34 are in error and should be reversed.

CONCLUSION

Applicant respectfully requests that each of the final rejections be reversed and that the claims subject to this Appeal be allowed to issue.

Respectfully submitted,

Date: October 12, 2006

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CLAIMS APPENDIX

The claims on appeal are:

1. A controlled debris perforating system, comprising:

a shaped charge having a charge case and an explosive material, the charge case defining at least one slot about which the charge case is adapted to fracture in response to detonation of the explosive material.

3. The controlled debris perforating system of claim 1, wherein the at least one slot is axially oriented.

6. The controlled debris perforating system of claim 1, wherein the at least one slot is a V-notched groove.

7. The controlled debris perforating system of claim 1, wherein the at least one slot is an external slot.

17. A method of using one or more shaped charges in a well, comprising:

providing a perforating string having one or more shaped charges, the shaped charges comprising a charge case defining at least one slot about which the charge case is adapted to fracture; and

conveying the perforating string into the well.

18. The method of claim 17, wherein the perforating string comprises a loading tube and carrier.

19. The method of claim 17, wherein the perforating string comprises a spiral gun.

22. The controlled debris perforating system of claim 1, wherein the case comprises an opening to receive the explosive material and the opening is separate from said at least one slot.

23. The controlled debris perforating system of claim 1, wherein said at least slot comprises at least one groove formed in a wall of the case.

25. The controlled debris perforating system of claim 23, wherein said at least one groove is cut into the wall of the case.

27. The method of claim 17, wherein the case comprises an opening to receive an explosive material and the opening is separate from said at least one slot.

28. The method of claim 17, wherein said at least slot comprises at least one groove formed in a wall of the case.

30. The method of claim 28, wherein said at least one groove is cut into the wall of the case.

33. A method of controlling the debris during perforating, comprising:

providing a shaped charge having a charge case defining at least one groove about which the charge case is adapted to fracture in response to detonation of an explosive.

34. The method of claim 33, wherein said at least one groove is axially oriented.

35. The method of claim 33, wherein said at least one groove is located on the outside of the charge case.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.